

WHAT IS CLAIMED IS:

1. A light emitting device comprising:
a plurality of pixels;
each of the plurality of pixels having a plurality of sub-pixels;
5 each of the plurality of sub-pixels having a light emitting element; and
each of the plurality of sub-pixels having a same area of effective light
emission.
2. A light emitting device comprising:
a plurality of pixels;
10 each of the plurality of pixels having a plurality of sub-pixels;
each of the plurality of sub-pixels having a light emitting element and a
thin film transistor;
wherein a current flowing in the light emitting element is controlled by
the thin film transistor; and
15 each of the plurality of sub-pixels having a same area of effective light
emission.
3. A device according to claim 2,
wherein the thin film transistor in each of the plurality of sub-pixels has
a same polarity.
- 20 4. An electronic apparatus using the light emitting device of claim 1.
5. A method of operating a light emitting device,

said light emitting device comprising:

a plurality of pixels;

each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting

5 element;

each of the plurality of sub-pixels having a same area of effective

light emission,

said method comprising the steps of:

controlling a period of time in which the light emitting element

10 emits a light in each of the plurality of sub-pixels by a digital video signal to thereby control a gradation of the respective pixels.

6. A method of operating a light emitting device,

said light emitting device comprising:

a plurality of pixels;

15 each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting

element;

each of the plurality of sub-pixels having a same area of effective

light emission,

20 said method comprising the steps of:

having a plurality of sub-frame periods in one frame period in the plurality of sub-pixels;

selecting whether or not the light emitting element in each of the plurality of sub-pixels emits a light for each of the plurality of sub-frame periods by

25 each of bits of digital video signals,

wherein the larger the sum of lengths of sub-frame periods in which the light emitting element in each of the plurality of sub-pixels emits a light becomes, the higher a gradation number of the respective pixels becomes.

7. A method of operating a light emitting device,
- 5 said light emitting device comprising:
- a plurality of pixels;
- each of the plurality of pixels having a plurality of sub-pixels;
- each of the plurality of sub-pixels having a light emitting element,
- a first thin film transistor, a second thin film transistor, and a third thin film
- 10 transistor,
- said method comprising the steps of:
- turning on the first thin film transistor in a same period in all of the
- plurality of sub-pixels;
- providing an electric potential of a digital video signal to a gate
- 15 electrode of the second thin film transistor during the first thin film transistor is
- on;
- controlling switching of the second thin film transistor by the
- electric potential of the digital video signal to select whether the light emitting
- element emits a light or not;
- 20 wherein the light emitting element does not emit the light when the
- third thin film transistor is on;
- controlling a period of time in which the light emitting element
- emits the light in each of the plurality of sub-pixels by the digital video signal to
- thereby control a gradation of the respective pixels,
- 25 wherein each of the plurality of sub-pixels has a same area of effective

light emission.

8. A method of operating a light emitting device,

said light emitting device comprising:

a plurality of pixels;

5 each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting element,

a first thin film transistor, a second thin film transistor, a third thin film transistor,
a source signal line, a writing gate signal line, an erasing gate signal line, and a power
supply line;

10 a gate electrode of the first thin film transistor being connected to
the writing gate signal line;

a source region and a drain region of the first thin film transistor;

wherein one the source and drain regions of the first thin film
transistor is connected to the source signal line while the other thereof connected
15 to a gate electrode of the second thin film transistor;

a source region of the second thin film transistor being connected
to the power supply line and a drain region of the second thin film transistor being
connected to a pixel electrode of the light emitting element;

20 a gate electrode of the third thin film transistor being connected to
the erasing gate signal line;

a source region and a drain region of the third thin film
transistor;

wherein one of the source and drain regions of the third thin film
transistor is connected to the power supply line and the other thereof is connected
25 to the gate electrode of the second thin film transistor,

said method comprising the steps of:

selecting writing gate signal lines of the plurality of pixels in a same period;

controlling a period of time in which the light emitting element emits a light in each of the plurality of sub-pixels by a digital video signal inputted to the source signal line to thereby control a gradation of each of the plurality of pixels,

wherein each of the plurality of sub-pixels has a same area of effective light emission.

9. A method of operating a light emitting device,

said light emitting device comprising:

a plurality of pixels;

each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting element,

a first thin film transistor, a second thin film transistor, a third thin film transistor, a source signal line, an erasing gate signal line, and a power supply line;

wherein the plurality of sub-pixels in a same pixel have commonly a writing gate signal line;

a gate electrode of the first thin film transistor being connected to the writing gate signal line;

a source region and a drain region of the first thin film transistor;

wherein one of the source and drain regions of the first thin film transistor is connected to the source signal line and the other thereof is connected to a gate electrode of the second thin film transistor;

a source region of the second thin film transistor being connected

to the power supply line and a drain region of the second thin film transistor being connected to a pixel electrode of the light emitting element;

a gate electrode of the third thin film transistor being connected to the erasing gate signal line;

5 a source region and a drain region of the third thin film transistor;

wherein one of the source and drain regions of the third thin film transistor is connected to the power supply line and the other thereof is connected to the gate electrode of the second thin film transistor,

10 said method comprising the steps of:

selecting writing gate signal lines of the plurality of pixels in a same period;

controlling a period of time in which the light emitting element emits a light in each of the plurality of sub-pixels by a digital video signal inputted to the source signal line to thereby control a gradation of each of the plurality of pixels,

15 wherein each of the plurality of sub-pixels has a same area of effective light emission.

10. A method of operating a light emitting device,

20 said light emitting device comprising:

a plurality of pixels;

each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting element,

a first thin film transistor, a second thin film transistor, a third thin film transistor,

25 a source signal line, a writing gate signal line, and an erasing gate signal line;

wherein the plurality of sub-pixels in a same pixel have commonly
a power supply line;

a gate electrode of the first thin film transistor being connected to
the writing gate signal line;

5 a source region and a drain region of the first thin film transistor;

wherein one of the source and drain regions of the first thin film
transistor is connected to the source signal line and the other thereof is connected
to a gate electrode of the second thin film transistor;

10 a source region of the second thin film transistor being connected
to the power supply line and a drain region of the second thin film transistor being
connected to a pixel electrode of the light emitting element;

a gate electrode of the third thin film transistor being connected to
the erasing gate signal line;

15 a source region and a drain region of the third thin film
transistor;

wherein one of the source and drain regions of the third thin film
transistor is connected to the power supply line and the other thereof is connected
to the gate electrode of the second thin film transistor,

said method comprising the steps of:

20 selecting writing gate signal lines of the plurality of pixels in a same
period;

controlling a period of time in which the light emitting element
emits a light in each of the plurality of sub-pixels by a digital video signal inputted
to the source signal line to thereby control a gradation of each of the plurality of
25 pixels,

wherein each of the plurality of sub-pixels has a same area of effective

light emission.

11. A method of operating a light emitting device,

said light emitting device comprising:

a plurality of pixels;

5 each of the plurality of pixels having a plurality of sub-pixels;

each of the plurality of sub-pixels having a light emitting element,

a first thin film transistor, a second thin film transistor, a third thin film transistor,
a source signal line, and an erasing gate signal line;

wherein the plurality of sub-pixels in a same pixel have commonly

10 a writing gate signal line and a power supply line;

a gate electrode of the first thin film transistor being connected to
the writing gate signal line;

a source region and a drain region of the first thin film transistor;

15 wherein one of the source and drain regions of the first thin film
transistor is connected to the source signal line and the other thereof is connected
to a gate electrode of the second thin film transistor;

a source region of the second thin film transistor being connected
to the power supply line and a drain region of the second thin film transistor being
connected to a pixel electrode of the light emitting element;

20 a gate electrode of the third thin film transistor is connected to the
erasing gate signal line;

a source region and a drain region of the third thin film
transistor;

25 wherein one of the source and drain regions of the third thin film
transistor is connected to the power supply line and the other thereof is connected

to the gate electrode of the second thin film transistor,

said method comprising the steps of:

selecting writing gate signal lines of the plurality of pixels in a same period;

5 controlling a period of time in which the light emitting element emits a light in each of the plurality of sub-pixels by a digital video signal inputted to the source signal line to thereby control a gradation of the respective pixels,

wherein each of the plurality of sub-pixels has a same area of effective light emission.

10 12. A method according to claim 7,

wherein the first thin film transistor in each of the plurality of sub-pixels has a same polarity.

13. A method according to claim 7,

15 wherein the second thin film transistor in each of the plurality of sub-pixels has a same polarity.

14. A method according to claim 7,

wherein the third thin film transistor in each of the plurality of sub-pixels has a same polarity.

15. A device according to claim 4,

20 wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle

type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

16. An electronic apparatus using the light emitting device of claim 2.

17. A device according to claim 16,

5 wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

10 18. A method according to claim 5,

 wherein the light emitting device is in combination with an electronic apparatus,

 wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop
15 (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

19. A method according to claim 6,

 wherein the light emitting device is in combination with an electronic
20 apparatus,

 wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop

(note-size) computer, a mobile computer, an image reproduction apparatus, a goggle type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

20. A method according to claim 7,

5 wherein the light emitting device is in combination with an electronic apparatus,

 wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle
10 type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

21. A method according to claim 8,

 wherein the first thin film transistor in each of the plurality of sub-pixels has a same polarity.

15 22. A method according to claim 8,

 wherein the second thin film transistor in each of the plurality of sub-pixels has a same polarity.

23. A method according to claim 8,

 wherein the third thin film transistor in each of the plurality of sub-pixels
20 has a same polarity.

24. A method according to claim 8,

wherein the light emitting device is in combination with an electronic apparatus,

wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop
5 (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

25. A method according to claim 9,

wherein the first thin film transistor in each of the plurality of sub-pixels
10 has a same polarity.

26. A method according to claim 9,

wherein the second thin film transistor in each of the plurality of sub-pixels has a same polarity.

27. A method according to claim 9,

wherein the third thin film transistor in each of the plurality of sub-pixels
15 has a same polarity.

28. A method according to claim 9,

wherein the light emitting device is in combination with an electronic apparatus,

wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop
20 (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle

type display (head mounted display), a video camera, a mobile phone (cellular phone), a front-type projector and a rear-type projector.

29. A method according to claim 10,
wherein the first thin film transistor in each of the plurality of sub-pixels
5 has a same polarity.

30. A method according to claim 10,
wherein the second thin film transistor in each of the plurality of sub-
pixels has a same polarity.

31. A method according to claim 10,
10 wherein the third thin film transistor in each of the plurality of sub-pixels
has a same polarity.

32. A method according to claim 10,
wherein the light emitting device is in combination with an electronic
apparatus,
15 wherein the electronic apparatus is one selected from the group
consisting of an electro-luminescence display device, a digital still camera, a laptop
(note-size) computer, a mobile computer, an image reproduction apparatus, a goggle
type display (head mounted display), a video camera, a mobile phone (cellular
phone), a front-type projector and a rear-type projector.

20 33. A method according to claim 11,
wherein the first thin film transistor in each of the plurality of sub-pixels

has a same polarity.

34. A method according to claim 11,

wherein the second thin film transistor in each of the plurality of sub-pixels has a same polarity.

5 35. A method according to claim 11,

wherein the third thin film transistor in each of the plurality of sub-pixels has a same polarity.

36. A method according to claim 11,

10 wherein the light emitting device is in combination with an electronic apparatus,

wherein the electronic apparatus is one selected from the group consisting of an electro-luminescence display device, a digital still camera, a laptop (note-size) computer, a mobile computer, an image reproduction apparatus, a goggle type display (head mounted display), a video camera, a mobile phone (cellular
15 phone), a front-type projector and a rear-type projector.